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10/542,674

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John R.A Ayres

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EXAMINER

ENGLUND, TERRY LEE

ART UNIT

PAPER NUMBER

2816

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/542,674

Applicant(s)

AYRES ET AL.

Examiner

Terry L. Englund

Art Unit

2816

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on Aug 7, 2007 & Aug 16, 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4,6,7,9,10 and 12-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6,7,9,10 and 12-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>20070816</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment/IDS***

The amendment submitted on Aug 7, 2007, and the IDS submitted on Aug 16, 2007, were reviewed and considered with the following results:

The added paragraphs overcame the objections to Figs. 4, 7, 9, and 11 by citing the reference characters C1, C2, R11, and R12. Therefore, those drawing objections have been withdrawn, and the drawings have now been approved by the examiner.

The amended paragraphs overcame the objections to pages 12 and 14 of the disclosure, as cited on page 2 of the previous Office Action. However, the amended paragraph on page 11 did not overcome its objection since the change replaced "P<sub>1a</sub>" with "--P<sub>1a</sub>--". Therefore, the objections to pages 12 and 14 have been withdrawn, but the objection to page 11 is maintained, and is described later under the appropriate section.

Cancelled claims 3, 5, 8, and 11 rendered their respective objection, and/or rejection, moot.

Amended claims 7, 9, 10, and 12-15 overcame their objections described on page 3 of the previous Office Action. Although those objections have now been withdrawn, some of the amended claims created new objections, which are described later under the appropriate section.

Amended claims 1-2, 4, 6-7, 9-10, and 12-16 overcame their rejections under 35 U.S.C. 112 as described on pages 3-5 of the previous Office Action. Although those rejections have now been withdrawn, some of the amended claims created new rejections, which are described later under the appropriate section.

The amended claims also overcame all of the prior art rejections cited within the previous Office Action on pages 5-9. Therefore, the following rejections have been withdrawn: 1) claims 1, 7, 9, 14-15, and 17-18 under 35 U.S.C. 102(b), with respect to Myono; 2) claims 1 and 7 under 35 U.S.C. 102(b), with respect to Morishita; 3) claims 2, 4 and 6 under 35 U.S.C. 103(a), with respect to Morishita; and 4) claims 10 and 19 under 35 U.S.C. 103(a), with respect to Myono et al. Neither Myono nor Morishita clearly shows or discloses a charge pump section comprising the first/second input switches, output switch, and first/second capacitors as now recited within amended independent claim 1. However, newly added claim 20 is rejected under prior art in the appropriate section described later since it only requires one input switch.

The references cited on the IDS submitted on Aug 16, 2007 were reviewed and considered. The reference of Sudo was used in rejecting claim 20. The reference of Fukushima et al. does not clearly show or disclose a voltage decreasing stage that shares an input with the voltage increasing stage. However, it is noted that its voltage increasing stages (e.g. CP1) correspond to stage 1 of the applicants' own Fig. 2.

### *Specification*

The disclosure remains objected to because of the following informality: Page 11, line 18 "P<sub>1a</sub>" should be --N<sub>1a</sub>--. Transistor N<sub>1a</sub> is coupled between capacitor C<sub>p1a</sub> and V<sub>in</sub>, which would allow the capacitor to charge, wherein transistor P<sub>1a</sub> is coupled between the capacitor and V<sub>out1</sub>. Therefore, an appropriate correction is still required.

### *Claim Objections*

Claims 1-2, 4, 6-7, 9-10, and 12-24 are objected to because of the following informalities: To correct a syntax oversight, each of independent claims 1, 20, and 24 should have "comprise"

on line 2 changed to --comprises--. Claims 12 and 13 are now identical to claims 9 and 10, respectively. Were claims 12 and 13 meant to depend on a claim other than claim 1, upon which claims 9 and 10 also depend upon? Dependent claims carry over any objection(s) from any claim(s) upon which they depend. Appropriate corrections are required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-2, 4, 6-7, 9-10, and 12-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicants regard as the invention. It is not clear in claim 1, lines 7-8 what "the charge pump section of the voltage increasing stage and of the voltage decreasing stage" relates to. For example, does the phrasing imply: 1) the two stages share a common charge pump section; 2) that each stage only comprises one charge pump section; or 3) that even if each stage comprises more than one charge pump section, only one of those sections needs to comprise the first/second input switches, output switch, and first/second capacitors as recited within claim 1? Claim 7 has a similar problem as claim 1. For example, which single "charge pump section of the voltage increasing stage and of the voltage decreasing stage" is being referred to? Also, how do the input/output switches, and capacitor of claim 7 relate to the first/second input switches, output switch, and first/second capacitors now cited within claim 1? It is not clear in claim 14 how "the first input switch and output switch are operated in complementary manner." For example, do these switches relate to switches only in one charge pump section, or with respect to switches in at least one other charge pump section? It is not understood how the charge pump capacitors of

claim 15 relate to the first/second capacitors already recited within claim 1. Claim 20, lines 7-8 have a problem similar to claim 1. For example, what does “the charge pump section of the voltage increasing stage and of the voltage decreasing stage” mean: a common charge pump section, only one section within each stage, or only one section of a possible plurality of sections? It is not clear in claim 20, line 9 how “a junction node” relates to “first junction node” cited on the same line. For example, do they refer to two distinct nodes, or to the same node? Claim 24, lines 7-8 have the same type of problem as claims 1 and 20. For example, what does “the charge pump section of the voltage increasing stage and of the voltage decreasing stage” mean? It is not clear in claim 24 how “a charge pump capacitor of at least one charge pump section”, cited on each of lines 13 and 14, relates to “the charge pump section” comprising first/second charge pump capacitors already cited within lines 7-11 of the same claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by Sudo, a reference cited on the IDS submitted Aug 16, 2007. Fig. 3A shows a charge pump circuit comprising voltage increasing stage M44-M46,C44-C45 comprising at least one charge pump section; voltage decreasing stage M41-M43,C41-C42 comprising at least one charge pump section; shared input (node N43) to the voltage increasing and voltage decreasing stages; and wherein each stage comprises at least one stage comprising an input switch and an output switch

connected in series, and having a charge pump capacitor connected between a junction node and a control line. For example, 1) section M44-M45,C44 of the voltage increasing stage comprises input switch M44, output switch M45, and capacitor C44 connected between junction node N44 and control line CLK1; and 2) section M42-M43,C42 of the voltage decreasing stage comprises input switch M43, output switch M42, and capacitor C42 connected between junction node N42 and control line CLK1. Therefore, claim 20 is anticipated.

Claim 20 is also rejected under 35 U.S.C. 102(b) as being anticipated by Tobita, a reference found during the recent update search. Fig. 2 shows a charge pump circuit comprising voltage increasing stage 230; voltage decreasing stage 200; and shared input ext Vcc. Figs. 14 and 15 show examples of a voltage decreasing stage and a voltage increasing stage, respectively. Each stage comprises an input switch, output switch, and capacitor. For example, 1) section p1-p2,c of the Fig. 15 voltage increasing stage comprises input switch p1, output switch p2, capacitor c connected between junction node q and control line d, and a connection to Vcc (the input); and 2) section p1-p2,c of the Fig. 14 voltage decreasing stage comprises input switch p1, output switch p2, capacitor c, and a connection to Vcc (the input). Therefore, when the stages of Figs. 14 and 15 are used for stages 220 and 230, respectively of Fig. 2, claim 20 is anticipated.

#### ***Prior Art***

The prior art reference cited on the accompanying PTO-892 is a reference providing an example disclosing and showing the relationship between a diode and a switch. Demi et al. shows switch Si in Fig. 4A, and Fig. 4B shows diode Si in place of the switch. Figs. 1 and 2 of Demi et al. show examples where a diode can be replaced by a transistor (switch), or vice versa. Demi et al. also discloses that a controllable switch can be a diode (e.g. see column 3, lines 30-

33, and column 4, lines 28-29). Therefore, one of ordinary skill in the art would understand a diode is one type of a switch.

No claim is allowable as presently written.

***Allowable Subject Matter***

However, independent claims 1 and 24 would be allowable if satisfactorily rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action. There is presently no motivation to modify or combine any prior art reference(s) to ensure the charge pump section comprises the first/second input switches, output switch, and first/second charge pump capacitors as recited within each of claims 1 and 24.

Claims 2, 4, 6-7, 9-10, and 12-19 would also be allowable if satisfactorily rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. These claims depend on claim 1 previously described above. [Note: Some of these claims only carry over the rejection from claim 1.]

Also, claims 21-23 would be allowable if satisfactorily rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph they carry over from claim 20, as set forth in this Office Action, and to include all of the limitations of the base claim and any intervening claims. There is presently no motivation to modify or combine any prior art reference(s) to ensure the corresponding stage increases or decreases the input voltage by an integer multiple of the difference between a low supply line and a high supply line as cited within claim 21, or that each charge pumping section increases (or decreases) its corresponding input voltage by the difference between a low supply line and a high supply line as cited within claims 22 and 23.



***Response to Arguments***

The applicant's arguments filed Aug 7, 2007 have been fully considered but they are not persuasive with respect to a diode not being a switch. Although diodes may not be controlled directly by a signal, one of ordinary skill in the art would understand they still effectively function as one type of a switch. For example, when a diode allows current flow, the diode/switch is considered on. When the diode doesn't allow current flow, the diode/switch is considered off. With this type of on/off operation, the diode does function as a switch. Also, the reference of Demi et al. (cited in one of the formal rejections described above) clearly cites "the controllable switch is a diode" on column 4, line 29. Thus one of ordinary skill in the art would have no problem identifying a diode as one type of a switch.

Therefore, the rejections described in this Office Action are deemed proper.

**THIS ACTION IS MADE FINAL.** The applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than XIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication from the examiner should be directed to Terry L. Englund whose telephone number is (571) 272-1743. The examiner can normally be reached Monday-Friday from 7 AM to 3 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Drew Richards, can be reached on (571) 272-1736.

The new central official fax number is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1562.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Terry L. Englund

23 October 2007

  
N. DREW RICHARDS  
SUPERVISORY PATENT EXAMINER